Docket No.: 1344.1001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of:

Masaki IWAMOTO et al.
Serial No. 09/014,422   Group Art Unit: 2178
Confirmation No. 4490
Filed: January 27, 1998   Examiner: Cong-Lac Huynh

For: INTERACTIVE DATA ANALYSIS SUPPORT APPARATUS AND MEDIA ON WHICH IS
       RECORDED AN INTERACTIVE DATA ANALYSIS SUPPORT PROGRAM

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In a Notice of Appeal filed September 6, 2005, the Applicants appealed the Examiner's March 4, 2005 Office Action finally rejecting claims 1-8, 10-19 and 21-26. Therefore, appellants' brief is due November 6, 2005. Submitted herewith are Appellants' Brief together with the requisite fee set forth in 37 C.F.R. § 41.20(b).

1

I. REAL PARTY IN INTEREST (37 CFR § 41.37(c)(I)(i)

The real party in interest is Fujitsu Limited, the assignee of the subject application.

II. RELATED APPEALS AND INTERFERENCES (37 CFR § 41.37(c)(l)(ii))

Appellants, Appellants' legal representatives and the assignee are not aware of any other appeals or interferences which will directly affect or be directly affected by, or have a bearing on, the Board's decision in the pending appeal.

III. STATUS OF CLAIMS (37 CFR § 41.37(c)(I)(iii))

Pending appealed claims 1, 4-8, 10-12, 15-19 and 21-26 have been rejected. Claims 2, 3, 9, 13, 14 and 20 have been cancelled.

IV. STATUS OF AMENDMENTS (37 CFR § 41.37(c)(l)(iv))

Appellants' Amendment under 37 CFR § 1.116 filed July 29, 2005 cancelled claims 2, 3, 13 and 14, and presented claim amendments to claims 1, 4, 8-10, 12, 15-19 and 21-26. This amendment was entered by the Examiner for purposes of Appeal as confirmed by an Advisory Action mailed August 16, 2005.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 CFR § 41.37(c)(l)(v))

A. Claims 1, 12, and 23

In one aspect, the present invention relates to a random extraction means for automatically extracting a random sampling of data from a data warehouse, and both a cross-tabulation display means and a graph display means for displaying the extracted random sampling of data according to summing up conditions. Summing up conditions are defined as logical operations, distinct from the statistical operation of extracting a random of the data in the data warehouse. See page 3, line 4 to line 10. The specification describes an embodiment of these features from page 9, line 7 through page 21, line 14. With this construction, the user performs data analysis on a reduced dataset that is statistically similar, yet significantly smaller, than what is contained in the data warehouse. Furthermore, before the reduced dataset is displayed (through either the cross-tabulation display means or the graph display means), the reduced dataset is tailored according to summing up conditions. As a result, the number of records used by the cross-tabulation display means and the graph display means is further reduced according to summing up conditions applied to the dataset under the user's direction while maintaining statistical similarity to the original data warehouse. It therefore becomes possible to apply summing up conditions on the dataset that is statistically similar to the original data warehouse and prepare either a cross-tabulation display or a graph display at a higher speed than what would be possible with the present invention. Even if a system does not have a high speed processing capability, a sufficient operation speed can be assured and the data analysis processing and a lower cost can be achieved (page 4, line 29 to page 5, line 7).

Referring to Figures 1-3, the features of the present invention as set forth in the claims are summarized below. Figures 1 and 2 illustrate a system structure of an embodiment in which the claimed interactive data analysis support apparatus, in accordance with the invention, is realized in a general-purpose computer system; namely the system 10 of Figure 2. The interactive data analysis support program can be stored, for example, in a portable storage medium such as a CD ROM or the like installed on a magnetic disk serving as auxiliary storage device 15, from a CD ROM drive, to execute the interactive data analysis support program (page 10, lines 7-10).

Referring to the language of the first element recited in independent claim 1, and the specification, both a reviewed information collection section 34, located on the server side, and a

reviewed information summarizing section 24, located on the client side, form a random extraction means for automatically extracting a random sampling of data from a data warehouse 32 (page 14, lines 7-14 and page 17, lines 11-16). The second element of claim 1, a cross-tabulation display means, is realized by an OLAP (Online Analytical Procedure) client section 21 and an OLAP server section (page 15, lines 18-19). Furthermore, the OLAP client section 21 comprises an OLAP 21a which acts as cross tabulation display means for displaying according to summing up conditions to set a range to be displayed by a cross tabulation in which the random sampling of the data extracted from the data warehouse by the random extraction means is cross summed up (page 10, lines 18-23 and page 15, lines 18-23). A cell specifying means, as recited in claim 1, is disclosed in figure 2 as Input Device 13, and includes a keyboard or similar device (page 9, lines 31-33). A visualizer section 22, a data mining section 23, and a reviewed information summarizing section on the client side 20, and a data mining section 33 and reviewed information collecting section 34 on the server 30 side form a graph display means disclosed in the fourth element of claim 1. Page 15, lines 19-23. The visualizer section, as disclosed on page 11, lines 10 and 11, includes a visualizer 22a and a data buffer22b for the visualizer. A data mining section 23 is comprised of a mining control section 331, a mining engine 23b, a data buffer 23c and a data conversion section, and operates as a display limiting means (page 13, line 28 to page 14, line 6). Lastly, the storage means recited in claim 1 include either an optical or magnetic storage medium, such as a CD-ROM or a magnetic disk (page 10, lines 2-10).

Referring to the language of the first element recited in independent claim 12, and the specification, both a reviewed information collection section 34, located on the server side, and a reviewed information summarizing section 24, located on the client side, form a random extraction operation for automatically extracting a random sampling of data from a data warehouse 32 (page 14, lines 7-14 and page 17, lines 11-16). The second element of claim 12, a cross-tabulation display operation, is realized by an OLAP (Online Analytical Procedure) client section 21 and an OLAP server section (page 15, lines 18-19). Furthermore, the OLAP client section 21 comprises an OLAP 21a which provides a cross tabulation display operation for displaying according to summing up conditions to set a range to be displayed by a cross tabulation in which the random sampling of the data extracted from the data warehouse by the random extraction operation is cross summed up (page 10, lines 18-23 and page 15, lines 18-23). A cell specifying operation, as recited in claim 12, is disclosed in figure 2 as Input Device 13, and includes a keyboard or similar device (page 9, lines 31-33). A visualizer section 22, a data mining section 23, and a reviewed information summarizing section on the client side 20,

7

and a data mining section 33 and reviewed information collecting section 34 on the server 30 side form a graph display operation disclosed in the fourth element of claim 12. Page 15, lines 19-23. The visualizer section, as disclosed on page 11, lines 10 and 11, includes a visualizer 22a and a data buffer22b for the visualizer. A data mining section 23 is comprised of a mining control section 23a, a mining engine 23b, a data buffer 23c and a data conversion section, and operates as a display limiting operation (page 13, line 28 to page 14, line 6). Lastly, the storage operation recited in claim 12 includes either an optical or magnetic storage medium, such as a CD-ROM or a magnetic disk (page 10, lines 2-10).

Referring to the language of the first element recited in independent claim 23, and the specification, both a reviewed information collection section 34, located on the server side, and a reviewed information summarizing section 24, located on the client side, form a random extraction device for automatically extracting a random sampling of data from a data warehouse 32 (page 14, lines 7-14 and page 17, lines 11-16). The second element of claim 23, a cross-tabulation display device, is realized by an OLAP (Online Analytical Procedure) client section 21 and an OLAP server section (page 15, lines 18-19). Furthermore, the OLAP client section 21 comprises an OLAP 21a which acts as cross tabulation display device for displaying according to summing up conditions to set a range to be displayed by a cross tabulation in which the random sampling of the data extracted from the data warehouse by the random extraction device is cross summed up (page 10, lines 18-23 and page 15, lines 18-23). A cell specifying device, as recited in claim 23, is disclosed in figure 2 as Input Device 13, and includes a keyboard or similar device (page 9, lines 31-33). A visualizer section 22, a data mining section 23, and a reviewed information summarizing section on the client side 20, and a data mining section 33 and reviewed information collecting section 34 on the server 30 side form a graph display device disclosed in the fourth element of claim 23. Page 15, lines 19-23. The visualizer section, as disclosed on page 11, lines 10 and 11, includes a visualizer 22a and a data buffer22b for the visualizer. A data mining section 23 is comprised of a mining control section 23a, a mining engine 23b, a data buffer 23c and a data conversion section 23d, and operates as a display limiting device (page 13, line 28 to page 14, line 6). Lastly, the storage device recited in claim 23 include either an optical or magnetic storage medium, such as a CD-ROM or a magnetic disk (page 10, lines 2-10.

VI.   ISSUES TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(l)(vi))

The primary issue is whether claims 1, 4-8, 10-12, 15-19 and 21-26 distinguish over Microsoft Excel 97 in view of U.S. Patent No. 5,893,090 to Friedman.

Another issue is whether claims 1 and 23 meet the requirements of 35 U.S.C. § 112, second paragraph.

VII.   ARGUMENT (37 C.F.R. § 41.337(c)(I)(vii))

In the final Office Action, the Examiner noted that claims 1-8, 10-19 and 21-26 were pending in the application and the Examiner rejected all claims as unpatentable over the prior art. By the Amendment Under 37 C.F.R. § 1.116, various claims were amended and this Amendment was entered. Thus, claims 1, 4-8, 10-12, 15-19 and 21-26 are pending in the application.

A. Rejection Under 35 U.S.C. § 112

Claims 1 and 23 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter. In particular, the Examiner took the position that there was insufficient antecedent basis for the term "data warehouse" in line 4 of each claim.

It is believed that the amendments to claims 1 and 23 which were presented in the Amendment Under 37 C.F.R. § 1.116 overcame this rejection by referring to "a data warehouse" instead of "the data warehouse" in line 4 of claims 1 and 23. However, the Advisory Action mailed August 16, 2005 did not comment on this point.

In summary, it is believed that claims 1 and 23 meet the requirements of 35 U.S.C. § 112.

B. Rejection of Claims 1-8, 10-19 And 21-26 Under 35 U.S.C. § 103

1. The Law Regarding the Obviousness Issues related by the Examiner

Under Graham v. John Deere Co.,383 U.S. 1,148 U.S.P.Q. 459 (1966) the scope and content of the prior art are to be determined, the differences between the prior art and the claims at issue are to be ascertained and the level of skill in the art is to be ascertained. Against this background the obviousness of the subject matter is determined.

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. (see ACS Hospital Systems, Inc. v. Montefiore Hospital, 221 USPQ 929, 932, 933 (Fed. Cir. 1984))

The prior art must not only suggest the desirability that the teachings of references be combined but must also suggest the desirability of the modifications in the manner proposed by the Examiner as well as the results to be achieved (see Ex parte Costa,211 U.S.P.Q. 636(P.O.Bd.App.1978), ACS Hospital Systems, Inc. v. Montefiore Hospital,732 F.2d 1572,221

U.S.P.Q. 929(Fed.Cir.1984), In re Gordon,733 F.2d 900,221 U.S.P.Q. 1125(Fed.Cir.1984), Lear Siegler v. Aeroquip Corp.,733 F.2d 881,221 U.S.P.Q. 1025(Fed.Cir.1984) and Diversitech v. Century Steps,850 F.2d 675,7 U.S.P.Q.2d 1315(Fed.Cir.1988)).

To set forth a prima facie obviousness case, evidence of motivation must be provided indicating why one skilled in the art would have been motivated, led, or suggested to modify an existing reference in view of another reference. The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. See In re Rilckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is made by presenting evidence that the "reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed substitution, combination or other modification." In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972); In re Lalu, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984). It is incumbent on the Examiner to state how and why the teachings of the references would have been combined. "If examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of the patent." In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Hindsight cannot be used in determining the issue of obviousness, and the reviewer must view the prior art without reading into that art the teachings of the application or patent (see Kalman v. Kimberly Clark Corp.,713 F.2d 760,218 U.S.P.Q. 781(Fed.Cir.1983)). "[T]he best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references . . . . Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight." In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher (see W.L. Gore & Associates, Inc. v. Garlock, Inc., 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984))

2. The Office Action

In item 10 on pages 3-6 of the final Office Action, dated March 4th,2005, the Examiner rejected claims 1-8, 10-19 and 21-26 under 35 U.S.C. § 103(a) as being unpatentable over Microsoft Excel 97 ("Excel") in view of U.S. Patent 5,893,090 to Friedman et al. ("Friedman").

3. The Prior Art

a. The Microsoft Excel 97 Reference ("Excel")

The Excel reference is directed to a spreadsheet program that incorporates several features, which are said to be unavailable in previous versions of Excel. The record does not indicate whether Excel can automatically populate a spreadsheet with the contents of a data warehouse. However, the record does indicate that Excel provides a graphical user interface that presents a user with empty rows and columns to allow for manual entry of data into each of the spreadsheet's "cells". The cells may include data that has been extracted from the database and manually entered into the spreadsheet's cells. Upon manual entry, the previously blank spreadsheet resembles a cross-tabulation of the data entered. With the manually entered cross-tabulation of data, Excel allows the user to select a number of cells for summation (the "AutoSum" feature). Additionally, the user may also reorder selected data. Excel also allows users to create graphical representations of data by manually selecting ranges of data to be displayed on the graph. Excel fails to teach extracting data automatically at random from a data warehouse. Furthermore, Excel fails to teach the application of summing up conditions to further refine the automatically randomly extracted data before the data is displayed by either a cross-tabulation means or a graph display means.

b.   The Friedman Reference ("Friedman")

U.S. Patent 5,893,090 to Friedman et al. is directed to a method and apparatus for performing an aggregate query in a database system. A random sample of records is extracted from the source database to generate a sample database. Then an aggregate query is performed on the sample database to generate a sample result, and an estimate of the aggregate query request on the source database is derived from the sample result. (See Abstract.)

The Examiner relies upon the table of Figure 5 and the portion of the specification at column 4, lines 1-48. As described therein, the sample Table 80 of Figure 5 is extracted from an extraction table. The sample Table 80 is generated by selecting records from a source table randomly to provide a substantially valid statistical sample. Friedman et al. discloses that a

12

pseudo-random algorithm may be used to select records from the source table. Friedman et al. further describes that in a data warehouse environment, the sample Table 80 may include about 1-10 percent of the records in the source Table.

4. The Present Claimed Invention Patentably Distinguishes Over The Prior Art

As admitted by the Examiner, Excel does not disclose automatically extracting a random sampling of data from the contents of the data warehouse. Page 4, line 1 of the final Office Action. The Examiner takes the position that it would have been obvious, at the time of the invention, to combine the features of Friedman with the features of Excel. Page 4, line 9-10 of the Office Action. The Examiner fails to provide a proper line of reasoning regarding how such a combination is taught or suggested by either Excel or Friedman. As the applicants understand it, the Examiner argues that Friedman teaches both automatic extraction of a random sampling of data from a data warehouse and automatic population of a spreadsheet, such as Excel, with the extracted data. Page 4, line 1-16 of the Office Action. The applicants see no evidence of such a teaching or suggestion in the two references cited by the Examiner. Thus, the Examiner has failed to meet the initial burden of establishing a *prima facie* case of obviousness.

Regarding independent claims 1, 12, and 23, the applicants argue that a combination of Excel and Friedman fails, at a minimum, to teach or suggest "displaying a cross tabulation according to summing up conditions for defining the range of the data to be displayed" as recited, for example, in independent claims 1, and recited in a similar manner in independent claims 12 and 23.

The Examiner relies upon Excel to disclose a cross-tabulation that allows the summation of a row and/or column (*e.g.* row 6 and column E, page 1 of Excel), and a data range can be selected (*e.g.* all cells in the range A1 to D4, page 7 of Excel) wherein Excel can display the selected data in graphical format (*e.g.* page 8 on Excel). Page 3, numbered paragraph 10 of the Office Action. Thus, applicants submit that Excel discloses displaying all data manually entered into a cross-tabulated form from a data warehouse, the results of the summation function and a graphical representation of selected data. Excel fails to teach or suggest the feature of "displaying a cross tabulation according to summing up conditions" wherein the "summing up conditions" define "the range of the data to be displayed" via the cross-tabulation means, as recited in claims 1, 12 and 23.

Furthermore, Excel fails to teach or suggest "storage means for storing the range of the data to be displayed which is limited by said display limiting means as a summing up condition used by said cross tabulation display means" as recited in claim 1, and recited in a similar

13

manner in claims 12 and 23. The Examiner, on page 5 lines 1-6 of the Office Action, relies upon Excel's AutoSum feature to disclose this feature. The Examiner's argument, according to the applicants' understanding, is that the summation performed by the AutoSum feature (*i.e.* an arithmetic function of adding a set of numbers) corresponds to the summing up conditions recited in currently amended claim 1. The AutoSum feature, which performs a mathematical summation operation on a selected row or column of data, fails to teach or suggest "summing up conditions," which are logical operations that define "the range of the data to be displayed" in either the cross-tabulation display means or the graph display means. The Examiner's argument mischaracterizes what a summing up condition is, as set forth in the subject application. Claims 1, 12 and 23 use the term cross summing (or cross summing up) to describe the type of summation operation performed by the AutoSum feature (see page 3, line 12-16 of the specification). Moreover, claim 1, 12 and 23 recites the application of (1) summing up conditions AND (2) cross-summing to the same data in the same element. If both "summing up conditions" and "cross summed up" are interpreted to mean the same thing (*i.e.* performing a summation operation on data), the claim becomes redundant, because two *identical* operations would be performed on the same data in the same element at the same time. However, the Examiner does not reject claims 1, 12 and 23 for being redundant, because it is not, but depends on Excel for disclosing both the summing up condition feature and the cross summing up feature that appears in claims 1, 12, and 23. The applicants also note that Excel fails to disclose a storage means for storing the summing up conditions, as recited in claim 1, 12 and 23.

In summary, it is submitted that the prior art does not teach or suggest an interactive data analysis support apparatus comprising:

> . . . cross tabulation display means for displaying a cross tabulation according to summing up conditions for defining the range of the data to be displayed in which the random sampling of data extracted from the contents of the data warehouse by the random extraction means is cross summed up;
> . . . graph display means for displaying the random sampling of data extracted from the contents of the data warehouse as a graph within the range of the cell specified by said cell specifying means,
>> wherein said graph display means comprises:
>>> display limiting means for limiting the range of the data to be displayed; and
>>>> storage means for storing the range of the data to be displayed

14

which is limited by said display limiting means as a summing up condition
used by said cross tabulation display means, and said cross tabulation
display means is capable of displaying cross tabulation in which the
random sampling of data extracted from the database is cross-summed
up according to the summing up condition stored by said storage means.

as set forth in claim 1. Therefore claim 1 is patentably distinguishable over the prior art.
Independent claims 12 and 23 have features similar to those of claim 1, and therefore are
equally patentably distinguishable over the prior art.

Therefore, the applicants respectfully request reconsideration of claims 1, 12 and 23
under 35 U.S.C. § 103(a) because Excel, Friedman and any combination thereof fails to teach or
suggest the above-identified features.

Claims 4-8, 10, 11, 15-19, 21, 22 and 24-26 depend from one of independent claims 1,
12 and 23 and include all the features of the claim from which they depend. Therefore, it is
submitted that claims 4-8, 10, 11, 15-19, 21, 22 and 24-26 patentably distinguish over the prior
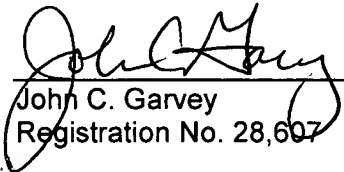art.

VIII.   CONCLUSION

In summary, it is submitted that claims 1, 4-8, 10-12, 15-9, and 21-26 patentably distinguish over the prior art. Reversal of the outstanding rejections is respectfully requested.

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The Commissioner is authorized to charge any Appeal Brief fee or Petition for Extension of Time fee for underpayment or credit any overpayment to Deposit Account 19-3935.

Respectfully submitted,
STAAS & HALSEY LLP

Date: __1-6-06__   By: _____
John C. Garvey
Registration No. 28,607

1201 New York Ave, N.W., Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501

X.   APPENDIX (37 C.F.R. § 41.67(c)(I)(viii)

1.   (PREVIOUSLY PRESENTED) An interactive data analysis support apparatus for supporting the analysis of data, said apparatus comprising:

random extraction means for automatically extracting a random sampling of data from contents of a data warehouse;

cross tabulation display means for displaying a cross tabulation according to summing up conditions for defining the range of the data to be displayed in which the random sampling of data extracted from the contents of the data warehouse by the random extraction means is cross summed up;

cell specifying means for specifying at least one cell among a number of cells constituting said cross tabulation; and

graph display means for displaying the random sampling of data extracted from the contents of the data warehouse as a graph within the range of the cell specified by said cell specifying means,

wherein said graph display means comprises:

display limiting means for limiting the range of the data to be displayed; and

storage means for storing the range of the data to be displayed which is limited by said display limiting means as a summing up condition used by said cross tabulation display means, and said cross tabulation display means is capable of displaying cross tabulation in which the random sampling of data extracted from the database is cross-summed up according to the summing up condition stored by said storage means.

2.   (Canceled)

3.   (Canceled)

4.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 1, wherein said graph display means comprises rearranging means for automatically rearranging in a graph the data to be displayed according to predetermined conditions.

5.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 4, wherein said graph display means stores, in said storage means, a summing up condition for limiting the range of the data to be displayed based upon the data which is rearranged by said rearranging means.

6.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 1, wherein said graph display means comprises:

automatic analyzing means for finding a new display item by extracting a characteristic of the random sampling of data extracted from the contents of the data warehouse, and display item-adding means for adding the new display item found by said automatic analyzing means to the graph.

7.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 6, wherein

said graph display means stores, in said storage means, a summing up condition for limiting the range of the data to be displayed based upon the new display item, added by said display item-adding means.

8.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 1, wherein the random sampling of data extracted from the contents of said data warehouse is an aggregate of records composed of a number of data items.

9.   (CANCELLED)

10.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 8, wherein said graph display means has a structure such that a graph is displayed designating said data item as an axis.

11.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 10, wherein said graph display means comprises the same number of axes as the data items constituting said records, and plots a point corresponding to a value of each data item with regard to each of said records, to thereby display a graph in which points plotted on adjacent axes are connected by a segment.

12.   (PREVIOUSLY PRESENTED) A medium on which is recorded an interactive data analysis support program for supporting the analysis of data wherein there is recorded at least a program for executing:

a random extraction operation extracting a random sampling of data automatically from contents of a data warehouse;

a cross tabulation display operation displaying a cross tabulation according to summing up conditions for defining the range of the data to be displayed in which the random sampling of data extracted from the contents of the data warehouse by the random extraction operation is

cross-summed up;

a cell specifying operation specifying at least one cell among a number of cells constituting said cross tabulation; and

a graph display operation displaying the random sampling of data extracted from the contents of the data warehouse as a graph within the range of the cell specified by said cell specifying operation,

wherein said graph display operation comprises:

a display limiting operation for limiting the range of the data to be displayed; and

a storage operation for storing the range of the data to be displayed which is limited by said display limiting operation as a summing up condition used by said cross tabulation display operation, and said cross tabulation display operation is capable of displaying cross tabulation in which the random sampling of data extracted from the contents of the data warehouse is cross-summed up according to the summing up condition stored by said storage operation.

13.   (CANCELED)

14.   (CANCELED)

15.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 12, wherein said graph display operation

comprises a rearranging operation for automatically rearranging in a graph the data to be displayed according to predetermined conditions.

16.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 15, wherein said graph display operation stores, in said storage operation, a summing up condition for limiting the range of the data to be displayed, based upon the data which is rearranged by said rearranging operation.

17.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 12, wherein said graph display operation comprises:
    an automatic analyzing operation for finding a new display item by extracting a characteristic of the random sampling of data extracted from the contents of the data warehouse, and a display item-adding function for adding the new display item found by said automatic analyzing operation to the graph.

18.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 17, wherein said graph display operation stores, in said storage operation, a summing up condition for limiting the range of the data to be displayed based upon the new display item, added by said display item-adding operation.

19.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 12, wherein the random sampling of data extracted from the contents of the data warehouse is an aggregate of records composed of a number of data items.

20.   (CANCELLED)

21.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 19, wherein said graph display operation has a structure such that a graph is displayed designating said data item as an axis.

22.   (PREVIOUSLY PRESENTED) The medium on which is recorded an interactive data analysis support program according to claim 21, wherein said graph display operation

comprises the same number of axes as the data items constituting said records, and plots a point corresponding to a value of each data item with regard to each of said records, to thereby display a graph in which points plotted on adjacent axes are connected by a segment.

23. (PREVIOUSLY PRESENTED) An interactive data analysis support apparatus for supporting the analysis of data, said apparatus comprising:

a random extraction device automatically extracting a random sampling of data from contents of a data warehouse;

a cross tabulation display device displaying a cross tabulation according to summing up conditions for defining the range of the data to be displayed in which the random sampling of data automatically extracted from the contents of a data warehouse is cross summed up;

a cell specifying device specifying at least one cell among a number of cells constituting said cross tabulation; and

a graph display device displaying the random sampling of data extracted from the contents of the data warehouse as a graph within the range of the cell specified by said cell specifying means,

wherein said graph display device comprises:

a display limiting device for limiting the range of the data to be displayed; and

a storage device for storing the range of the data to be displayed which is limited by said display limiting device as a summing up condition used by said cross tabulation display device, and said cross tabulation display device is capable of displaying cross tabulation in which the random sampling of data extracted from the contents of the data warehouse is cross-summed up according to the summing up condition stored by said storage device.

24. (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 23, wherein said graph display device stores, in said storage device, a summing up condition for limiting the range of the data to be displayed based upon an operation in a graph.

25. (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 23, wherein said graph display device comprises a rearranging device for automatically rearranging in a graph the data to be displayed according to predetermined conditions.

26.   (PREVIOUSLY PRESENTED) The interactive data analysis support apparatus according to claim 23, wherein said graph display means comprises:

an automatic analyzing device finding a new display item by extracting a characteristic of the random sampling of data extracted from the contents of the data warehouse, and a display item-adding device adding the new display item found by said automatic analyzing device to the graph.

XI.   EVIDENCE APPENDIX (37 C.F.R. § 41.337(c)(I)(ix))

Not applicable.

XII.   RELATED PROCEEDING APPENDIX (37 C.F.R. § 41.337(c)(l)(x))

Not applicable.